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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/692,135	10/19/2000	Roy C. Challberg	24-AT-5990	6878

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EXAMINER

RICHARDSON, JOHN A

ART UNIT	PAPER NUMBER
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3641

DATE MAILED: 06/13/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

09/692,135

Applicant(s)

CHALLBERG, ROY C.

Examiner

John Richardson

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 12 April 2002.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1 to 16 is/are pending in the application.
- 4a) Of the above claim(s) 5 and 13 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1 to 4, 6 to 12, 14 to 16 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

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**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

**Priority under 35 U.S.C. §§ 119 and 120**

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 4.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other:

**DETAILED ACTION**

***Non Final Rejection***

1). The applicant's response dated April 12 2002 (Paper No. 6) electing species Y reading on claims 1 to 4, 6 to 12, 14 to 16 is acknowledged. The applicant's traverse is on the grounds that search would not result in an undue burden on the examiner. This is not found persuasive because the applicant has not submitted evidence or identified such evidence now of record showing the species to be 'obvious variants' or clearly admit on the record that this is the case.

The requirement is still deemed proper and is therefore made FINAL.

2). Claims 5, 13 are withdrawn from further consideration pursuant to 37 CFR 1.142(b), as being drawn to a nonelected species, there being no allowable generic or linking claim. Applicant timely traversed the restriction (election) requirement in Paper No.6.

3). The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

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4). The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5). The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

6). The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

7). Claims 1 to 16 are rejected under 35 U.S.C. 112, first paragraph, as containing subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention, i.e., failing to provide an enabling disclosure.

There is no adequate disclosure of how and in what manner "arranged in staggered rows" is intended to be implemented. The specification merely states in pages 3, lines 1 to 19 that this relates to a so-called "F-lattice configuration". Note that a disclosure in an

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application, to be complete, must contain such description and detail as to enable any person skilled in the art or science to which the invention pertains to make and use the invention as of its filing date, *In re Glass*, 181 USPQ 31.

8). Claims 1 to 16 are rejected under 35 U.S.C. 112, first paragraph, as containing subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention, i.e., there is no enabling disclosure.

There is no adequate disclosure nor enabling disclosure of what constitutes "large

→ control rods".

Note that a disclosure in an application, to be complete, must contain such description and detail as to enable any person skilled in the art or science to which the invention pertains to make and use the invention as of its filing date, *In re Glass*, 181 USPQ 31.

9). Claims 1 to 16 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

→ The claims are vague, indefinite and incomplete as to what is meant by "arranged in staggered rows". The metes and bounds of the claims are undefined.

For example, does "arranged in staggered rows" imply a zigzag configuration, an alternating configuration, an overlapping configuration?

10). Claims 1 to 16 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. The term "large control rods" in claims 1 and 9 is a relative term, which renders the claim indefinite. The term "large control rod" is not defined by the claim, the specification does not provide a standard for ascertaining the requisite degree, and one of ordinary skill in the art would not be reasonably appraised of the scope of the invention.

The claims are vague, indefinite and incomplete as to what is meant by 'large control rods'. For example, are "large control rods" large relative to 600 Mwe sized BWR nuclear reactors, large relative to 1200 Mwe BWR sized nuclear reactors, or large relative to latest evolved designs of ABWR's (Advanced Boiling Water Reactors)?

✓ 11). Claims 1 to 16 are rejected under 35 U.S.C. 112, first paragraph, as containing subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

Claim 1, line 14, claim 9 recite in line 16 recite the limitation **a lower tie-plate of a fuel bundle**.

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The claims are vague are vague, indefinite and incomplete as to what is meant by a **lower tie-plate of a fuel bundle**. For example is the tie-plate, the tie-plate as previously cited in the claim preambles, or is the tie-plate an additional tie-plate? ←

12). Claims 1 to 4, 6, 9 to 12, 14 are rejected under 35 U.S.C. 102(b) as being anticipated by Dalke et al (U.S. 5,519,746).

The reference discloses a boiling water reactor (BWR) core plate assembly fuel channel design comprising a plurality of control rods (item 12), a plurality of cruciform shaped control rod guide tubes (item 86), a plurality of four fuel sub-bundles (items 26) having lower tie-plates (items 50, 150), a flat plate (items P, P'), plurality of support beam type structures on top of the said plates (for each fuel assembly items 42), plurality of control rod guide tube openings arranged in a pattern across the reactor core (see Figure 2, detail showing openings / slots to receive control rod items 12), a plurality of fuel supports (items 40), and said supports comprising a coolant flow inlet (item 62), a coolant flow outlet sized to receive the lower tie-plate (item 50) of the said fuel bundle (item 26), a coolant flow bore extending between said coolant inlets and outlets with said inlet off-set from said outlet with the said coolant flow inlet parallel to said coolant flow outlet (see Figures 4, 9 configurations).

As relating to claims 2, 10 the reference discloses control rod guide tube openings with four slots radially extending from a central location at right angles to each other (item 86), as relating to claims 3, 11 the venturi shaped coolant inlet sections of items 42, 142, provide a means of coolant flow pressure drop and are broadly readable on the

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orifice plate specified, see for example, Figure 5, item 90, as relating to claim 4 the fuel bundle receiving areas shown in Figure 4, item 54 and as relating to claims 6, 14, one fuel support per fuel bundle is disclosed in Figure 4, item 40.

13). Claims 7, 8, 15, 16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Dalke et al (U.S. 5,519,746) as applied to claims 1 to 4, 6, 9 to 12, 14, in view of Hirukawa (U.S. 5,267,286).

The primary reference has been discussed above and discloses the claimed invention except for reciting a plurality of coolant flow inlets. The secondary reference discloses that it is well known in the BWR nuclear reactor fuel art to provide a plurality of coolant flow inlets at the lower nozzle fuel assembly. It would have been obvious to one of ordinary skill in the art at the time of the invention to have substituted detail common inlet opening (item 62) of Dalke et al, with detail Figure 5C, items 67 of Hirukawa to facilitate void fraction control due to increased coolant pressure drop.

14). The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Note that Wolters jr et al (U.S. 4,767,595) teaches BWR control rod slot openings, Yates et al (U.S. 5,481,577) teaches BWR lower nozzle inlet off-sets, Challberg et al (U.S. 6,097,779), Hitachi (J6 1264289), Hitachi (I) (J6 2005197) teach General Electric BWR control rod lattice designs, and Berglund et al (U.S. 3,888,732), Asea Atom (DE 2245006) teach plurality of lower nozzle coolant inlets and outlets.



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15). Any inquiry concerning this communication or earlier communications from the examiner should be directed to John Richardson whose telephone number is (703) 305 0764. The examiner can normally be reached on Monday to Thursday from 7.00 AM to 4.30 PM. The examiner can also be reached on alternate Fridays.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Michael Carone, can be reached on (703) 306 4198. The fax phone number for the organization where this application or proceeding is assigned is (703) 305 7687.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308 1113.

John Richardson, PE,

June 06 2002.



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